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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/889,113	07/11/2001	Katsuhiko Mochizuki	1232-01	7939

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EXAMINER

BOYD, JENNIFER A

ART UNIT	PAPER NUMBER
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1771

DATE MAILED: 04/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/889,113

Applicant(s)

MOCHIZUKI ET AL.

Examiner

Jennifer A Boyd

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10, 12-19 and 21-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10, 12-19 and 21-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 1, 2004 has been entered. The Applicant's Amendments and Accompanying Remarks, filed April 1, 2004, have been entered and have been carefully considered. Claims 1, 12 and 15 are amended, claims 11 and 20 are cancelled and claims 1 – 10, 12 – 19 and 21 – 23 are pending. In view of the Applicant's Amendments, the Examiner withdraws the previously set forth rejections as detailed in paragraphs 4 and 6 of the previous Office Action dated January 8, 2004. Despite these advances, the invention as currently claimed is not found to be patentable for reasons herein below.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 112

3. Claims 1 - 14 remains rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The details of the rejection can be found in paragraphs 2 - 3 of the previous Office Action dated February 5, 2003. The rejection is maintained.

Claim Rejections - 35 USC § 103

4. Claims 1 – 10, 12 – 13, 15 – 19 and 22 – 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujimoto (EP 1033422A1).

As to claim 1, Fujimoto teaches a polyester fiber comprising 90% or more by weight of a poly(trimethylene terephthalate) (Abstract). Fujimoto teaches that the fiber of the present invention is preferably in the form of a multifilament yarn (page 6, lines 9 – 10). Fujimoto teaches that the elastic modulus range, or Young's modulus, acceptable for the fiber is from 17 to 30 g/d (15.02 – 26.50 cN/dtex), which overlaps the Applicant's range of no more than 25 cN/dtex (page 5, lines 54 – 58).

As to claim 2, Fujimoto teaches that the elastic modulus range, or Young's modulus, acceptable for the fiber is from 17 to 30 g/d (15.02 – 26.50 cN/dtex), which overlaps the Applicant's range of no more than 22 cN/dtex (page 5, lines 54 – 58).

As to claim 7, Fujimoto teaches that the boil-off shrinkage is preferably from 7 – 14%, more preferably from 8 – 12%, which overlaps the Applicant's range of 3 – 15% (page 5, lines 8 – 10).

As to claim 13, Fujimoto teaches that the individual filament size is from 0.1 to 10 denier (0.556 – 11.1 dtex), preferably from 0.5 – 5 denier (0.55 – 5.56 dtex), which overlaps the Applicant's range of no more than 3 dtex (page 6, lines 11 – 12).

As to claims 15 and 16, Fujimoto teaches a method of producing a poly (trimethylene terephthalate) fiber where the yarn is drawn, heat treated and then subjected to a relaxation treatment (page 6, lines 45-50). The intrinsic viscosity of the polymer is 0.4 – 1.5, preferably 0.7

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– 1.2 (page 4, lines 24 – 26) as required by claims 15 and 16. In the process, the multifilaments are extruded from a spinning machine (page 7, lines 20 – 24) and wound round a first roll heated at 30 – 80 degrees Celsius having a peripheral speed of 300 to 3,500 m/min without winding thereon (page 7, lines 10-19) as required by claim 15.

As to claim 17, Fujimoto teaches that multifilaments are extruded from a spinning machine at a temperature from 250 – 290 degrees Celsius (page 7, lines 20 – 24), which is 22 – 62°C higher than the melt temperature.

As to claims 18 and 22, Fujimoto teaches that the fibers are drawn on the first roll heated at 30 – 80°C having a peripheral speed of 300 to 3,500 m/min without winding thereon (page 7, lines 10-19). The draw temperature is -15 – 35°C higher than the glass transition temperature of poly (trimethylene terephthalate) which is 45°C.

As to claim 23, Fujimoto teaches that the fibers have the relaxation heat treatment performed on the second and third rolls at temperatures 100 – 160°C and 120 - 150°C respectively (page 8, lines 25 – 55).

As to claim 1, Fujimoto fails to teach the strength being at least 3 cN/dtex, the minimum value of the differential Young's modulus at 3 – 10% extension is no more than 10 cN/dtex and the elastic recovery following 10% elongation is at least 90%. As to claim 3, Fujimoto fails to teach that the differential Young's modulus at 3 – 10% extension is no more than 5 cN/dtex. As to claim 4, Fujimoto fails to teach that the residual extension is at least 45%. As to claim 5, Fujimoto fails to teach that the elastic recovery following 10% elongation is at least 95%. As to claim 6, Fujimoto fails to teach that the degree of crystallinity is at least 30%. As to claim 7,

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Fujimoto fails to teach that the maximum value of shrinkage is no more than 0.3 cN/dtex at a temperature of at least 120 degrees Celsius. As to claim 8, Fujimoto fails to teach that the maximum value of the shrinkage stress is 0.15 to 0.25 cN/dtex. As to claim 9, Fujimoto fails to teach that the maximum value of shrinkage stress is shown at least 130 degrees Celsius. As to claim 10, Fujimoto fails to teach that the continuous shrinkage in the yarn lengthwise direction is no more than 5%. As to claim 15, Fujimoto fails to teach that the relaxation factor is 6 – 20% after the relaxation heat treatment. As to claim 19, Fujimoto fails to teach that the relaxation factor is 8 – 18% after the relaxation heat treatment. Although Fujimoto does not explicitly teach the claimed properties as described above, it is reasonable to presume that the said properties are inherent to Fujimoto. Support for said presumption is found in the use of like materials (i.e. a multi-filament yarn comprising polytrimethylene terephthalate subjected to a relaxation heat treatment), which would result in the claimed property. The burden is upon the Applicant to prove otherwise. *In re Fitzgerald* 205 USPQ 594. In addition, the presently claimed properties mentioned above would obviously have been present once the Fujimoto product is provided. Note *In re Best*, 195 USPQ at 433, footnote 4 (CCPA 1977). In the present invention, one would have been motivated to have a polytrimethylene terephthalate yarn with high strength, low modulus, high elastic recovery, high degree of crystallinity and low shrinkage stress and shrinkage to provide a stable, strong and functional yarn.

As to claims 1 and 12, Fujimoto teaches the claimed invention except fails to disclose that the CF value is 1 – 30 as required by claim 1 and the CF value is 5 – 25 as required by claim 12. It should be noted that CF is a result effective variable. For example, as the CF value

increases, the breakage rate of the yarn increases. It would have been obvious to one having ordinary skill in the art at the time the invention was made to optimize the CF value for the yarn since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In the present invention, one would have been motivated to optimize the CF value of the yarn in order to create a stable and strong yarn with high resistance to breakage.

5. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujimoto (EP 1033422A1) in view of Matsuo (JP 11-100747). The rejection is maintained. The details of the rejection can be found in paragraph 9 of the previous Office Action dated February 5, 2003.

6. Claims 15 – 19 and 21 - 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujimoto (EP 1033422A1) in view of Schippers (US 5,343,601).

As to claims 15 and 21, Fujimoto teaches a method of producing a poly (trimethylene terephthalate) fiber where the yarn is drawn, heat treated and then subjected to a relaxation treatment (page 6, lines 45-50). Fujimoto teaches that the multifilaments are extruded while molten (page 7, lines 31 – 33) implying melt spinning. The intrinsic viscosity of the polymer is 0.4 – 1.5, preferably 0.7 – 1.2 (page 4, lines 24 – 26). In the process, the multifilaments are extruded from a spinning machine (page 7, lines 20 – 24) and wound round a first roll heated at 30 – 80 degrees Celsius having a peripheral speed of 300 to 3,500 m/min without winding thereon (page 7, lines 10-19). Fujimoto teaches that the fibers may be mixed together by any means and may include an interlacing procedure (page 9, lines 40 – 48).

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As to claim 16, Fujimoto teaches that the intrinsic viscosity of the polymer is 0.4 – 1.5, preferably 0.7 – 1.2 (page 4, lines 24 – 26).

As to claim 17, Fujimoto teaches that multifilaments are extruded from a spinning machine at a temperature from 250 – 290 degrees Celsius (page 7, lines 20 – 24), which is 22 – 62°C higher than the melt temperature.

As to claims 18 and 22, Fujimoto teaches that the fibers are drawn on the first roll heated at 30 – 80°C having a peripheral speed of 300 to 3,500 m/min without winding thereon (page 7, lines 10-19). The draw temperature is -15 – 35°C higher than the glass transition temperature of poly (trimethylene terephthalate) which is 45°C.

As to claim 23, Fujimoto teaches that the fibers have the relaxation heat treatment performed on the second and third rolls at temperatures 100 – 160°C and 120 - 150°C respectively (page 8, lines 25 – 55).

As to claims 15 and 21, Fujimoto fails to teach that the rolls used in the drawing and heat-treatment processes has a rough surface.

Schippers teaches a method of making a synthetic yarn such in which the rolls have a rough or matte surface (column 3, lines 50 – 65).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to create the poly(trimethylene terephthalate) yarn according to the process of Fujimoto with the rough surfaced rolls suggested by Schippers motivated by the expectation have better control over the drawing process.

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As to claims 15 and 21, Fujimoto in view of Schippers discloses the claimed invention except for a surface roughness of 1.5S – 8S and CF value is 1 – 30 as required by claim 15 and a surface roughness of 3.2S – 6.3S as required by claim 21. It should be noted that the surface roughness is a result effective variable; for example, as the surface roughness increases, the drawing process is more controlled. It should be noted that CF is a result effective variable. For example, as the CF value increases, the breakage rate of the yarn increases. It would have been obvious to one having ordinary skill in the art at the time the invention was made to create the rough roll with the suggested surface roughnesses since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In the present invention, one would have been motivated to optimize the surface roughness and the CF value to have proper control over the drawing process and to create a stable and strong yarn with high resistance to breakage.

As to claims 15 and 19, Fujimoto in view of Schippers fails to teach that the relaxation factor is 6 – 20% after the relaxation heat treatment as required by claim 15 and the relaxation factor is 8 – 18% after the relaxation heat treatment as required by claim 19. Although Fujimoto in view of Schippers does not explicitly teach the claimed properties as described above, it is reasonable to presume that the said properties are inherent to Fujimoto in view of Schippers. Support for said presumption is found in the use of like materials (i.e. a multi-filament yarn comprising polytrimethylene terephthalate subjected to a relaxation heat treatment), which would result in the claimed property. The burden is upon the Applicant to prove otherwise. *In re Fitzgerald* 205 USPQ 594. In addition, the presently claimed properties mentioned above would

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obviously have been present once the Fujimoto in view of Schippers product is provided. Note *In re Best*, 195 USPQ at 433, footnote 4 (CCPA 1977).

Response to Arguments

7. Applicant's arguments filed April 1, 2004 have been fully considered but they are not persuasive.

8. In response to Applicant's arguments that claims 1 – 14 are in compliance with 35 USC 112, the Examiner respectfully argues the contrary. The only chemical and structural limitations in claim 1 is a multi-filament yarn comprising polytrimethylene terephthalate with a CF value of 1 - 30. The other limitations of claim 1 such as strength, Young's modulus and elastic recovery are properties which a direct result of chemical and structural limitations. Therefore, if the Applicant believes that the properties of his invention such as the strength, Young's modulus and elastic recovery of the polytrimethylene terephthalate yarn differ from the yarn of Fujimoto, the Applicant must recite the additional chemical and structural limitations which differentiates his invention from Fujimoto or any other invention that comprises a multifilament polytrimethylene yarn. If the said properties are not inherent, it is asserted that the claim must be incomplete. In other words, if the Applicant asserts a lack of inherency in the admitted prior art, then the Applicant's claimed invention is missing an element critical to the invention which would patentably distinguish it from the known prior art. Additionally, claims 2 – 14 are dependent on claim 1 and do not add sufficient chemical and structural limitations to differentiate it from Fujimoto. Therefore, the Examiner assumes inherency for those physical properties as well until the Applicant chemically or structurally differentiates his invention which would provide for the set forth physical limitations.

9. In response to Applicant's arguments that the Experimental Report of Jinichiro Kato is sufficient evidence to assert that the yarn of Fujimoto has a minimum value of differential

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Young's modulus at 3 – 10% elongation of 8 cN/dtex thus overturning the rejection over Fujimoto, the Examiner argues the contrary. The Examiner requests that the submission of the Experimental Report of Jinichiro Kato be in a 1.132 Declaration format to be given full consideration. It should be noted that the Examiner has not given consideration to the document at this point in time.

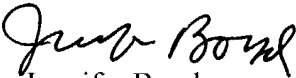
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10. In response to Applicant's arguments that Fujimoto does not teach or suggest an interlacing treatment that would create a yarn with a CF value of 1 – 30, the Examiner argues the contrary. As noted in the 35 U.S.C. 103 rejection as unpatentable over Fujimoto above, Fujimoto teaches that the fibers may be mixed together by any means and may include an interlacing procedure (page 9, lines 40 – 48). Although, Fujimoto does not teach that the interlacing treatment results in a yarn CF value of 1 – 30, it is known in the art that the interlacing treatment can be optimized to create a yarn with a CF value of 1 – 30.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A Boyd whose telephone number is 571-272-1473. The examiner can normally be reached on Monday thru Friday (8:30am - 6:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on 571-272-1478. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Jennifer Boyd

April 8, 2004


Ula C. Ruddock
Primary Examiner
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